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Myocardial Recovery and the Failing Heart

2465

Douglas L. Mann, Philip M. Barger, Daniel Burkhoff

Medical and device therapies that reduce heart failure morbidity and mortality also lead to decreased left ventricular volume and mass, and a more normal elliptical shape of the ventricle. These are due to changes in myocyte size, structure, and organization that have been referred to collectively as “reverse remodeling.” Despite the frequent interchangeable use of the terms myocardial recovery and reverse remodeling, Mann and colleagues propose that there are important differences between these 2 phenomenon. They discuss the biology of cardiac remodeling, cardiac reverse remodeling, and myocardial recovery, with the intent of providing a conceptual framework for understanding myocardial recovery.

CLINICAL RESEARCH

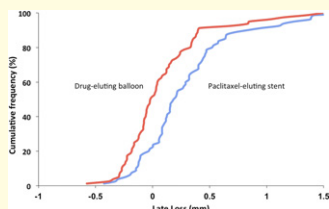
INTERVENTIONAL CARDIOLOGY

Drug-Eluting Balloon May Be Superior to DES for Small Vessels

2473

Azeem Latib, Antonio Colombo, Fausto Castrì, Antonio Micari, Alberto Cremonesi, Francesco De Felice, Alfredo Marchese, Maurizio Tespili, Patrizia Presbitero, Gregory A. Sgueglia, Francesca Buffoli, Corrado Tamburino, Ferdinando Varbella, Alberto Menozzi

Latib and colleagues randomized 182 patients with coronary stenoses in small vessels (reference diameter <2.8mm) to treatment with a paclitaxel drug-eluting balloon (DEB) and provisional bare-metal stenting (BMS) or paclitaxel-eluting stent (PES) implantation. The primary endpoint of in-stent (in-balloon) late loss was significantly lower with DEB. At 6 months, DEB and PES were associated with similar rates of angiographic restenosis, target lesion revascularization, and MACE. These results suggest that DEB may be superior to PES for interventions in small vessels.



INTERVENTIONAL CARDIOLOGY

Improved Outcomes With Radial Access for STEACS

2481

Enrico Romagnoli, Giuseppe Biondi-Zoccai, Alessandro Sciabbasi, Luigi Politi, Stefano Rigattieri, Gianluca Pendenza, Francesco Summari, Roberto Patrizi, Ambra Borghi, Cristian Di Russo, Claudio Moretti, Pierfrancesco Agostoni, Paolo Loschiavo, Ernesto Lioy, Imad Sheiban, Giuseppe Sangiorgi

The RIFLE trial compared outcomes in 1,000 ST-segment elevation acute coronary syndrome (STEACS) patients undergoing primary/rescue percutaneous coronary intervention. The primary endpoint was the 30-day rate of net adverse clinical event (NACE) (defined as composite of cardiac death, stroke, myocardial infarction, target lesion revascularization, and bleeding) was 14% in the radial arm and 21% in the femoral arm. Radial access was associated with significantly lower rates of cardiac mortality, bleeding, and shorter hospital stays. Radial access in patients with STEACS is associated with significant clinical benefits, in terms of both lower morbidity and cardiac mortality.

INTERVENTIONAL CARDIOLOGY

Effects of Radial Versus Femoral Artery Access in Patients With ACS With or Without STEMI

2490

Shamir R. Mehta, Sanjit S. Jolly, John Cairns, Kari Niemela, Sunil V. Rao, Asim N. Cheema, Philippe Gabriel Steg, Warren J. Cantor, Vladimír Džavík, Andrzej Budaj, Michael Rokoss, Vicent Valentin, Peggy Gao, Salim Yusuf

The RIVAL Trial randomized patients with ST-segment elevation myocardial infarction (STEMI) and non-ST-segment elevation acute coronary syndrome (NSTEMI) to radial or femoral access for their angiography. In STEMI patients, radial access reduced the primary outcome of death/MI/stroke/non-CABG-related major bleeding compared with femoral access (3.1% vs 5.2%). For NSTEMI, the rates were not different. In STEMI patients, death/MI/stroke was also reduced with radial access, as was all-cause mortality, with again no difference in NSTEMI patients. This trial confirms the benefits of radial access for STEMI patients, but no evidence that it benefits lower risk NSTEMI patients.

Editorial Comment: Olivier F. Bertrand, Tejas Patel, page 2500

HEART FAILURE

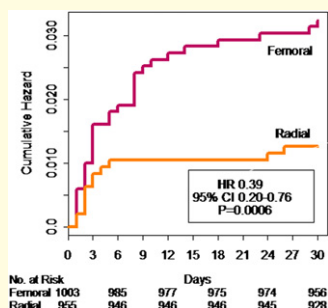
High Incidence of HF or CM After Trastuzumab Therapy for Breast Cancer

2504

Jersey Chen, Jessica B. Long, Arti Hurria, Cynthia Owusu, Richard M. Steingart, Cary P. Gross

Chen and colleagues used Medicare data to estimate heart failure (HF) and cardiomyopathy (CM) rates following chemotherapy and adjuvant trastuzumab in older women for breast cancer. Almost 50,000 women age 67 to 94 years with early-stage breast cancer were identified. Adjusted 3-year HF/CM incidence rates were higher for patients receiving trastuzumab (32 per 100 patients) and anthracycline plus trastuzumab (42 per 100 patients) compared with no adjuvant therapy (18 per 100 patients). These results show that at least one-third of elderly women.

Editorial Comment: Daniel J. Lenihan, page 2513



HEART RHYTHM DISORDERS

Measuring Vagal Reflexes Following Exercise Stress Test May Improve Risk Stratification in Patients With Long QT Syndrome

2515

Lia Crotti, Carla Spazzolini, Alessandra P. Porretta, Federica Dagradi, Erika Taravelli, Barbara Petracci, Alessandro Vicentini, Matteo Pedrazzini, Maria Teresa La Rovere, Emilio Vanoli, Althea Goosen, Marshall Heradien, Paul A. Brink, Alfred L. George Jr., Peter J. Schwartz

Crotti and colleagues have previously shown that depressed baroreflex sensitivity (BRS), a marker of reduced vagal reflexes, predicts the risk of symptoms in long QT syndrome (LQTS) type 1 (LQT1) patients. For this report, they assessed the utility of another marker of vagal reflexes, heart rate recovery after exercise. Data was obtained from LQTS genotype-positive patients who performed an exercise stress test. Despite similar maximal heart rate and workload, the symptomatic patients LQTS1 patients had a greater heart rate (HR) reduction in the first minute after exercise compared to the asymptomatic. There was no difference in HR recovery in LQT2 and LQT3 patients stratified by symptoms. These results suggest that heart rate recovery after exercise may be useful for risk stratification in LQT1 patients.

Editorial Comment: Koonlawee Nademanee, page 2525

CARDIAC IMAGING

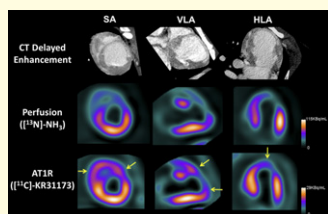
PET/CT Imaging of Cardiac Angiotensin II Type 1 Receptors

2527

Kenji Fukushima, Paco E. Bravo, Takahiro Higuchi, Karl H. Schuleri, Xiaoping Lin, M. Roselle Abraham, Jinsong Xia, William B. Mathews, Robert F. Dannals, Albert C. Lardo, Zsolt Szabo, Frank M. Bengel

Fukushima and colleagues explored the feasibility of targeted imaging of the angiotensin II subtype 1 receptor (AT1R) in cardiac tissue using hybrid positron emission tomography/computed tomography (PET/CT) and a novel AT1R ligand. PET/CT was performed in healthy pigs and pigs 3 to 4 weeks after experimental myocardial infarction. In healthy pigs, AT1R expression was regionally homogeneous. After myocardial infarction, AT1R was upregulated in the infarct area relative to remote myocardium, and elevated in both regions compared to healthy hearts. First-in-man application was safe, and showed detectable and specific myocardial retention of the AT1R ligand. Noninvasive imaging of cardiac AT1R expression is feasible using PET/CT technology.

Editorial Comment: Thomas H. Schindler, Vasken Dilsizian, page 2535



BIOMARKERS

Moderate Physical Activity Appears to Protect Against HF

2539

Christopher R. deFilippi, James A. de Lemos, Andrew T. Tkaczuk, Robert H. Christenson, Mercedes R. Carnethon, David S. Siscovick, John S. Gottdiener, Stephen L. Seliger

deFilippi and colleagues evaluated the association between physical activity and serum levels of highly sensitive troponin T (cTnT) and amino-terminal B-type natriuretic peptide (NT-proBNP), along with the subsequent risk of heart failure (HF). Compared to participants with the lowest physical activity (on a scale of 1 to 7), those with the highest were only one-half as likely to have a significant rise in NT-proBNP and one-third as likely to have a rise in cTnT. A higher activity score was also associated with a lower long-term incidence of HF. These findings suggest that moderate physical activity has protective effects on early HF phenotypes.

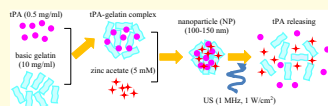
Editorial Comment: Christopher M. O'Connor, Tariq Ahmad, page 2548

PRE-CLINICAL RESEARCH

Targeted Thrombolysis With Novel Drug Delivery System

2550

Hiroyuki Kawata, Yoshiko Uesugi, Tsunenari Soeda, Yasuhiro Takemoto, Ji-Hee Sung, Kiyotaka Umaki, Keiji Kato, Kenichi Ogiwara, Keiji Nogami, Kenichi Ishigami, Manabu Horii, Shiro Uemura, Midori Shima, Yasubiko Tabata, Yoshibiko Saito



Kawata and colleagues recently produced nanoparticles composed of tissue-type plasminogen activator (tPA), basic gelatin, and zinc ions. This formulation suppresses tPA activity by 50%, but full tPA activity can be restored with ultrasound (US) disruption of the particles. In a mouse arterial thrombosis model, the nanoparticles were confirmed to bind to von Willebrand factor (vWF), and preferentially accumulate at the site of thrombus. In a swine acute myocardial infarction (AMI) model, plasma tPA activity after intravenous injection of nanoparticles was about 25% of tPA prior to US application. During US application, plasma tPA activity near the affected coronary artery was higher than the femoral artery. This drug delivery system may improve intravenous coronary thrombolysis without increasing the risk of bleeding.

Editorial Comment: Tomoko Ichiki, John C. Burnett, Jr., page 2558